

REMARKS

This is in response to the office action dated December 29, 2005. A petition for a one month extension of time is submitted herewith.

In regard to paragraph 1 of the office action, claim 1 has been amended to include parenthesis around the reference numerals in the claims.

In regard to paragraph 2 of the office action and claims 25-45 and 48 it is perfectly acceptable to use "A" in the claims as indicated. As a matter of the fact the Examiner allowed such use in the parent application. No correction is required or needed.

In regard to paragraphs 3 and 4 of the office action and claim 33 it has been amended as requested by the Examiner.

In regard to paragraphs 5 and 6, claim 47 was rejected over claim 39 of the '542 patent based on same invention type double patenting. Claim 47 has been amended to include the subject matter of claim 48. Claim 48 has been cancelled.

In regard to paragraphs 7 and 8 of the office and the rejection of claims 24-46 and 48-49, please find enclosed a terminal disclaimer to overcome the obviousness type double patenting rejection of these claims.

In regard to paragraphs 9 and 10 of the office action and the rejection of claims 24- 25 as being anticipated under 35 U.S.C. 102(e) as by Rothwell, III (USP 6,175,723) please see the following:

Section 102(e) is not believed to be appropriate and applicable because the

rejection does not set forth the timing sequence required by the statute.

Reconsideration of the rejection is hereby requested as section 102(e) is not applicable.

5 Additionally, the rejection of claims 24-25 as anticipated by Rothwell is not correct. In electromagnetic wave propagation, frequency times wavelength is equal to the speed of light. Dimensions of an antenna usually depend on the wavelength, or frequency, of the wave for which the antenna is designed to receive or transmit. Frequency is the number of electromagnetic oscillations per second. Wavelength is equal to the speed of light (300 million m/sec) divided by the
10 frequency. Thus, low frequency waves have long wavelengths and high frequency waves have short wavelengths. The length of an antenna must be such that it resonates electrically at the desired wavelength. For resonation to occur, antenna length must be at least one-quarter wavelength or an integral multiple thereof. Antennas having such dimensions are called resonant antennas. A resonant
15 antenna at center frequency is an efficient propagator and receptor of electromagnetic energy at its design wavelength.

 In Rothwell, the patent discusses connecting '**Antenna Elements**' together with switches. The '**Antenna Elements**' of Rothwell are not antennas by themselves, they are small pieces of metal of a given shape which are assembled
20 according to a given configuration of switches to achieve a metallic structure having optimum radiation properties. **The assembled structure is a single**

antenna composed of a set of objects (wires) which by themselves cannot be considered as antennas but only as antenna elements. In the instant patent application of Borlez et al., a variable lobe array of antennas composed of a set of antennas (resonating at the center frequency with good radiation properties) is disclosed and claimed. The switches generate the array of antennas by connecting them together.

In Fig. 3 of Rothwell, it appears clear that the antenna structure is composed of several wires having lengths connected to each other by the switches. These lengths are relatively small compared to the wavelengths at the considered frequencies (TV UHF and VHF, col. 4, lines 3 et seq. citing frequencies of 30-500 Mhz). These frequencies correspond to wavelengths of .6 to 10 meters. Alone the radiation properties of the wires are very poor. If the ‘**Antenna Elements**’ of Rothwell approached the usual quarter wavelength size, it would make the size of the structure prohibitively large.

Rothwell, col. 5, line 17 describes the antenna array 10 (Fig. 1) having 3 rows of 4 elements 12, and seventeen junctions 18 and 2^{17} (131,072) structural arrangements. Further, if there are 6 rows and 6 columns of elements, there are 50 junctions and more than one trillion arrangements. If the “**antenna elements**” of Rothwell were antennas, the antenna array would be huge if it were to operate at a frequency of 30 MHz (10 meter wavelength) disclosed in Rothwell.

In Fig. 4 of Rothwell, the discs are not the patch antenna disclosed in the

Borlez et al. patent application because the discs would be prohibitively large at the frequencies of interest in Rothwell. The discs of Rothwell are just metallic antenna elements which when connected form a single antenna structure, not an array of antennas. The way the discs are interconnected would prohibit their use if the discs were resonating antennas due to field repartition.

The instant invention of Borlez et al. is designed to operate at a single resonant microwave frequency for use in a garage door sensor application. The Rothwell antenna is mainly intended for VHF and UHF Television communications. In these frequency bands, the technology of antennas does not use a planar substrate to hold the antennas.

Claim 24 of the Borlez et al. application recites antennas (33, 41, 49) positioned on a planar substrate. Each antenna includes three patches two of which are hard-wired with no switches or junctions therebetween. Patches which are hard-wired together form antennas and this structure is different than that disclosed by Rothwell wherein Rothwell at Col. 4 lines 8-19 admits that the control lines for each junction present “serious design considerations” which are overcome and compensated for by the microprocessor which adapts accordingly.

Additionally, the Borlez et al. specification states:

[t]hat the antenna structure is composed of three lines 33, 49 and 41 of three patches each. The left line 33 comprises three patches each 34, 36, 38, the right line 41 patches 42, 44, 46 and the central line 49

patches 40, 48, 50. Each line 33, 41, 49 forms an antenna element.
In each line the patches are electrically connected to each other by
the mentioned microstrip lines 58, 60 and 62, respectively.
Therefore, three antenna elements are formed on the planar antenna.
(Specification, page 9, lines 14-22).

.....
...The other patches 34, 36, 38, 40, 42, 44, 46, and 48 which have a
length optimized to make each patch resonate at the central
frequency of the antenna. (Specification, page 9, lines 27-30)

In fact, the patches resonate in phase. Rothwell does not anticipate claim
24 as it does not disclose antennas (33, 41 49) being selectively electrically
connectable to one or more antennas. **Rothwell discloses antenna elements
which are really pieces of an antenna configurable over a range of frequencies
to form an antenna which meets a specific need such as a moving automobile
or mobile telephone.**

In the instant application a structure is disclosed and claimed in claim 24
corresponding to an array of hard-wired antennas, not pieces of an antenna.
Applicants invention operates at higher frequencies and correspondingly lower
wavelengths which allows affordable size for the substrate antennas operating at a
single frequency. These antennas are linked to each other by switches which then
allow them to form two different arrays of antennas according to the state of the
switches.

Reconsideration of claims 24-25 is requested as they are believed to be
patentable.

In paragraphs 11 and 12 of the office action, claim 26 was rejected under 35 USC

103(a) as being unpatentable over Rothwell.

As set forth above, the antenna elements of Rothwell are pieces of metal, not antennas, and they are not sized so as to resonate. The pieces of metal are far too small. In fact, they cannot be sized to resonate as they would be exceedingly large for operation at their intended frequencies. Claim 26 requires that the length of the antenna patches be sized so as to resonate. Rothwell does not teach or suggest sizing patches, nor does it teach or suggest use of the patches. Rothwell does not teach or suggest operating at a central frequency.

Reconsideration of claim 26 is respectfully requested.

In paragraph 13 of the final office action, claims 29-40 and 43-48 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rothwell in view of Grenon et al (USP 6,064,862).

A review of the references indicates that there is no suggestion to combine the teachings thereof and applicants' respectfully submit that their combination is improper. Such a suggestion is required and absent such a showing in the alleged prior art, it is respectfully asserted that the Examiner has impermissibly used the applicant's teaching to hunt through the prior art for the claimed elements and combine them as claimed. See, for example, *In re Bond*, 910 F.2d 831, 15 USPQ 2d 1566 (Fed. Cir. 1990). Here, there is no suggestion in either reference to combine the elements as claimed.

It is not believed that a person skilled in the art would look to combine the technology of Rothwell which teaches the configuration of metal pieces of antenna with

the technology of Grenon et al. '862 which discloses horn shaped antenna elements 304, 420, not planar antenna elements as claimed in claims 29-40 and 43-47. Grenon couples the horn shaped antenna to a tuneable diplexer for communication with a transceiver. It is respectfully suggested that the final office action, paragraph 13, page 6, lines 1 et seq., is inaccurate wherein it is stated that Grenon discloses a waveguide comprising a transition to a *planar* antenna. It is clear that Grenon does not disclose a planar antenna.

In regard to claims 29-40 and 43-47, they are patentable as dependent directly or indirectly on patentable claims 24. In regard to amended claim 47 and claims 43-46 the Examiner did not apply the references to the claims. Rothwell does not anticipate claim 24 as stated above and it does not disclose every feature of claim 24. Further, the technology of the configurable arrangement of metallic pieces of Rothwell is not properly or logically combinable with the tuneable microwave digital radio of Grenon which employs a horn shaped radio and a tuneable diplexer. Rothwell does not teach or suggest the need for a waveguide.

Reconsideration of claims 29-40 and 43-47 is respectfully requested.

In paragraph 14 of the office action, claims 39-42 were rejected under 35 U.S.C 103(a) as being unpatentable over Rothwell in view of McEwan (USP 5,966,090).

As indicated previously hereinabove, Rothwell does not disclose the features of claim 24 and, as such, the instant rejection must fail because all of the claims are directly or indirectly dependent on allowable and patentable claim 24. Further, there is no

suggestion in Rothwell or McEwan '090 to combine the teachings thereof or to modify the teachings thereof to arrive at the claimed invention. Such a suggestion is required and absent such a showing in the alleged prior art, it is respectfully asserted that the Examiner has impermissibly used the applicant's teaching to hunt through the prior art for the claimed elements and combine them as claimed.

Rothwell discloses configurable metallic elements which form antennas suited to receive or send electromagnetic radiation. McEwan's sensor is a large bandwidth antenna due to its pulsed nature. Further, neither Rothwell nor McEwan disclose switching between two antenna configurations as recited in claim 39. McEwan, as understood, provides different burst widths to obtain target information at different ranges. McEwan does sample and hold Doppler signals at different ranges but not according to two different antenna configurations as recited in claim 39.

Claims 39-42 are believed patentable and reconsideration of them is respectfully requested.

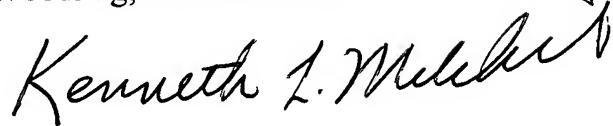
Applicants thank the Patent Examiner for the allowance of claim 50.

Reconsideration of all of the claims is respectfully requested.

A telephone call to the undersigned is respectfully requested if it would expedite the examination and allowance of the application.

Respectfully Submitted,

Woodling, Krost and Rust

A handwritten signature in black ink, reading "Kenneth L. Mitchell". The signature is written in a cursive style with a large, stylized "K" and "M".

Kenneth L. Mitchell,
Reg. No. 36,873
Patent Attorney
Registered Professional Engineer
Woodling, Krost and Rust
9213 Chillicothe Road
Kirtland, Ohio 44094
(440) 256-4150 phone
(440) 256-7453 fax